

In the Specification

Please amend the Specification as indicated below. The language being added is underlined ("___") and the language being deleted contains strikethrough ("—"):

For the paragraph beginning on page 3, line 6 through the paragraph beginning on page 5, line 16:

Thus, it would be desirable to have a ~~PAM~~-communication system, such as a PAM communication system, capable of using most or all of the available channel capacity.

SUMMARY OF THE INVENTION

The present invention provides systems and methods for encoding fractional bit rates in a communication system, for example, a PAM communication system ~~pulse amplitude modulation (PAM) communication system~~. The systems and methods enable a first PAM transceiver to specify to a second ~~PAM~~ transceiver a desired fractional bit rate for transmitting data to the first ~~PAM~~ transceiver. Thus, the systems and methods of the present invention for the first time enable a single standardized specification of a generalized transmitter that may be used to implement any type of fractional encoding or mapping.

Briefly described, in architecture, one of many possible implementations of a transceiver according to the present invention comprises a means for receiving information associated with a destination transceiver, the information relating to a plurality of signal space constellation points ~~pulse amplitude modulation (PAM) levels~~ supported by the destination transceiver and a means for encoding, based on the information associated with the destination transceiver, an integer number of bits into a plurality of symbols such that the ratio of the integer number of bits and the plurality of symbols is a non-integer. The transceiver may further comprise a means for


encoding, based on the information associated with the destination transceiver, each of the plurality of symbols into one of a plurality of analog symbols corresponding to a the signal space constellation points. The system may also comprise a means for providing the plurality of analog symbols to the destination transceiver.

Briefly, another possible implementation of a transceiver according to the present invention comprises a means for providing information to a source transceiver, the information capable of being used to determine a fractional bit rate, a means for receiving a plurality of analog symbols from the source transceiver, each of the plurality of analog symbols corresponding to a ~~PAM~~ signal space constellation, and a means for decoding the plurality of analog symbols into an integer number of bits comprising a plurality of symbols such that the ratio of the integer number of bits and the plurality of symbols is a non-integer corresponding to the fractional bit rate.

The present invention can also be viewed as providing one or more methods for encoding fractional bit rates in a ~~PAM~~ communication system. Briefly, one such method involves the steps of: receiving information associated with a destination transceiver, the information relating to a plurality of ~~PAM levels~~ signal space constellation points supported by the destination transceiver and, based on the information associated with the destination transceiver, encoding an integer number of bits into a plurality of symbols such that the ratio of the integer number of bits and the plurality of symbols is a non-integer. The method may further involve encoding each of the plurality of symbols into one of a plurality of analog symbols corresponding to a the signal space constellation points and providing the plurality of analog symbols to the destination transceiver.

The present invention may also be viewed as providing one or more methods for controlling the symbol transmission rate in a ~~pulse amplitude modulation (PAM)~~

communication system. Briefly, one such method involves the following steps: (1) providing information to a source transceiver, the information capable of being used to determine a fractional bit rate, (2) receiving a plurality of analog symbols from the source transceiver, each of the plurality of analog symbols corresponding to a PAM-signal space constellation, and (3) decoding the plurality of analog symbols into an integer number of bits comprising a plurality of symbols such that the ratio of the integer number of bits and the plurality of symbols is a non-integer corresponding to the fractional bit rate.

 Briefly, another such method for controlling the symbol rate supplied to a destination transceiver over a communication channel in a PAM-communication system involves the following steps: (1) determining a maximum number of PAM-levels signal space constellation points capable of being supported by the destination transceiver and the communication channel, (2) providing information associated with the maximum number of PAM-levels signal space constellation points to a source transceiver, (3) receiving a plurality of analog symbols on the communication channel, each of the plurality of analog symbols corresponding to a the plurality of signal space constellation points and one of the maximum number of PAM-levels, signal space constellation points and (4) decoding the plurality of analog symbols into an integer number of bits comprising a plurality of symbols such that the ratio of the integer number of bits and the plurality of symbols is a non-integer corresponding to a fractional bit rate associated with the maximum number of PAM-levels signal space constellation points.
